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# मानक

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Mazdoor Kisan Shakti Sangathan

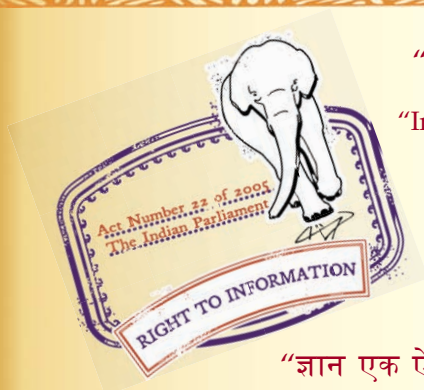
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IS 1159 (1981): Baking Powder [FAD 16: Foodgrains, Starches and Ready to Eat Foods]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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**IS : 1159 - 1981**

( Reaffirmed ~~2005~~  
2010 )

***Indian Standard***  
**SPECIFICATION FOR**  
**BAKING POWDER**  
**( *First Revision* )**

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**( First Reprint MAY 1996 )**

**UDC 664.643**

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**BUREAU OF INDIAN STANDARDS**  
**MANAK BHAVAN, 9, BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI-110002**

***Price Group 3***

***September 1981***

# *Indian Standard*

## SPECIFICATION FOR BAKING POWDER

### ( *First Revision* )

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**IS : 1159 - 1981**

*( Continued from page 1 )*

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**AMENDMENT NO. 1 JUNE 1996  
TO  
IS 1159 : 1981 SPECIFICATION FOR BAKING POWDER  
( First Revision )**

( *Page 3, clause 0.3* ) — Insert the following clauses after 0.3 and renumber the subsequent clauses:

**'0.4** A scheme for labelling environment friendly products to be known as ECO Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark shall be administered by the *Bureau of Indian Standards (BIS)* under the *BIS Act, 1986* as per the Resolution No. 71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR No. 85(E) dated 21 February 1991. For a product to be eligible for ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environmental friendly (EF) requirements. The EF requirements for baking powder, is therefore, being included through an Amendment No. 1 to this standard.

**0.5** This Amendment is based on the Gazette Notification No. 215(E) dated 17 May 1996 for labelling Food Additives as environment friendly products, published by the Ministry of Environment and Forests.'

( *Page 4, clause 3.2* ) — Insert the following clauses after 3.2:

**'3.3 Criteria For ECO Mark**

**3.3.1 General Requirements**

**3.3.1.1** The product shall conform to the quality standards of BIS.

**3.3.1.2** The product manufacturer shall produce the consent clearance as per the provisions of *Water ( Prevention & Control of Pollution ) Act, 1974* and *Air (Prevention & Control of Pollution) Act, 1981*, *Water (Prevention & Control of Pollution) Cess Act, 1977* respectively alongwith the authorisation, if required, under *Environment ( Protection ) Act, 1986* and the Rules made thereunder to Bureau of Indian Standards while applying for the ECO Mark; and the product shall be in accordance with the *Prevention of Food Adulteration Act, 1954* and the Rules made thereunder unless otherwise specified.

**3.3.1.3** The product/packing shall display in brief the criteria based on which the product has been labelled environment friendly.

**Amend No. 1 to IS 1159 : 1981**

**3.3.1.4 The material used for product/packaging shall be recyclable or biodegradable.**

**3.3.1.5 The date of manufacture and date of expiry shall be declared on the product/package by the manufacturer.**

**3.3.1.6 The product/package or leaflet accompanying it may display instructions of proper use and storage so as to maximise the product performance, safety and minimise wastage.'**

**( FAD 8 )**



**Indian Standard**  
**SPECIFICATION FOR**  
**BAKING POWDER**  
**( *First Revision* )**

**0. FOREWORD**

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 30 January 1981, after the draft finalized by the Bakery and Confectionery Industry Sectional Committee had been approved by the Agricultural and Food Products Division Council.

**0.2** Baking powder finds widespread use as a 'chemical leavener' of dough for bakery products. The constituents of baking powder are (a) sodium bicarbonate, (b) edible starch, and (c) acid reacting component. The acid reacting component may be any one or a combination of these given under 2.1.3. On wetting, baking powder produces carbon dioxide by the action of acid reacting component on sodium bicarbonate.

**0.3** This Indian Standard was first published in 1957. In this revision the requirement for carbon dioxide has been increased, and that for copper, zinc and tin has been deleted. A list of edible starches which can be used are also listed. In addition an alternative method for the determination of carbon dioxide has also been included. This revision also incorporates amendments No. 1 and 2 issued to the standard.

**0.4** In the preparation of this standard, due consideration has been given to the prevention of Food Adulteration Act, 1954 and the Rules framed thereunder. Due consideration has also been given to the Standards of Weights and Measures ( Packaged Commodities ) Rules, 1977. However, the standard is subject to the restrictions imposed under these, whenever applicable.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 - 1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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\*Rules for rounding off numerical values ( *revised* ).

## **1. SCOPE**

**1.1** This standard prescribes the requirements and the methods of sampling and test for baking powder.

## **2. INGREDIENTS**

**2.1** Baking powder shall contain the following materials.

**2.1.1** *Sodium Bicarbonate* ( see IS : 2124 - 1974\* ).

**2.1.2** *Edible Starches* — such as maize starch ( see IS : 1005 - 1976† ), tapioca starch ( see IS : 1319 - 1969‡ ), rice starch, wheat starch, arrowroot starch ( see IS : 1006 - 1967§ ), potato starch, sorghum starch or other neutral material such as calcium lactate, anhydrous calcium sulphate, sodium sulphate and other similar compounds.

**2.1.3** *Acid Reacting Component* — The acid reacting component, shall be free from flavour. It shall be any one or a combination of the following:

- a) Sodium acid pyrophosphate with or without mono acid calcium phosphate,
- b) Mono acid calcium phosphate with or without dicalcium orthophosphate,
- c) Potassium hydrogen tartrate or tartaric acid or a mixture of both,
- d) Acid compounds of aluminium, and
- e) Glucono delta lactone.

## **3. REQUIREMENTS**

**3.1** The product shall be in the form of a free-flowing, whitish powder and free from any off odour. It shall be free from dirt, insect or fungus infestation and adulterants. It shall also be free from any other harmful or injurious foreign matter.

**NOTE** — The appearance and odour shall be determined by organoleptic tests.

**3.2** The material shall also conform with the requirements given in Table 1.

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\*Specification for sodium bicarbonate ( *first revision* ).

†Specification for edible maize starch ( corn flour ) ( *first revision* ).

‡Specification for edible tapioca starch ( *first revision* ).

§Specification for arrowroot starch ( *first revision* ).

**TABLE 1 REQUIREMENTS FOR BAKING POWDER**  
( Clause 3.2 )

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST ( REF TO )
(1)	(2)	(3)	(4)
i)	Available carbon dioxide percent by mass, <i>Min</i>	12.0	Appendix A
ii)	Arsenic ( as As ), mg/kg, <i>Max</i>	1.1	Cl 12 of IS : 6287 - 1971*
iii)	Heavy metals ( as Pb ), mg/kg, <i>Max</i>	10.0	Cl 13 of IS : 6287 - 1971*

\*Methods of sampling and analysis of sugar confectionery.

#### 4. PACKING

4.1 Unless otherwise agreed to between the purchaser and the vendor, the material shall be packed in clean, sound and air-tight containers.

#### 5. MARKING

5.1 The following particulars shall be clearly and indelibly marked on each container:

- a) Name of the material;
- b) Name of the manufacturer;
- c) Batch or code number;
- d) Net mass; and
- e) Other labelling requirements according to the provisions of the Standards of Weights & Measures ( Packaged Commodity ) Rules, 1977.

5.1.1 Each container may also be marked with the ISI Certification Mark.

**NOTE** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 6. SAMPLING

6.1 Representative samples of the material shall be drawn and conformity of the material to the requirement of the specification shall be determined according to the procedure given in Appendix B.

## 7. TESTS AND CRITERIA FOR CONFORMITY

7.1 Tests shall be carried out as prescribed under 3.1 and in the appropriate appendices and clauses specified in col 4 of Table 1.

7.2 **Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water ( *see* IS : 1070-1977\* ) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

# APPENDIX A

[ Table 1, Item ( i ) ]

## DETERMINATION OF AVAILABLE CARBON DIOXIDE

A-0. Two methods have been prescribed. Any of these can be used depending on the facilities available.

### A-1. METHOD I

#### A-1.1 Apparatus

A-1.1.1 *Schroedter's Alkalimeter* — as shown in Fig. 1.

#### A-1.2 Reagent

A-1.2.1 *Sulphuric Acid* — sp gr 1.84.

#### A-1.3 Procedure

A-1.3.1 Fill bulb *A* with water and bulb *B* with sulphuric acid to a height of 25 mm above the port *C* through which carbon dioxide escapes into the acid. Weigh the alkalimeter. Introduce about one gram of the sample through the side opening *D*, into the decomposition flask *E*. Weigh the alkalimeter again. Open the stopcock *F* and allow about 25-ml of water to flow into the flask *E*. Allow the initial vigorous reaction to subside. Place the apparatus over a low flame and boil the solution for about 3 minutes. Aspirate carbon dioxide-free air through the solution by applying suction at *G*, the air first passing through soda lime. Weigh the alkalimeter again.

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\* Specification for water for general laboratory use ( *second revision* ).

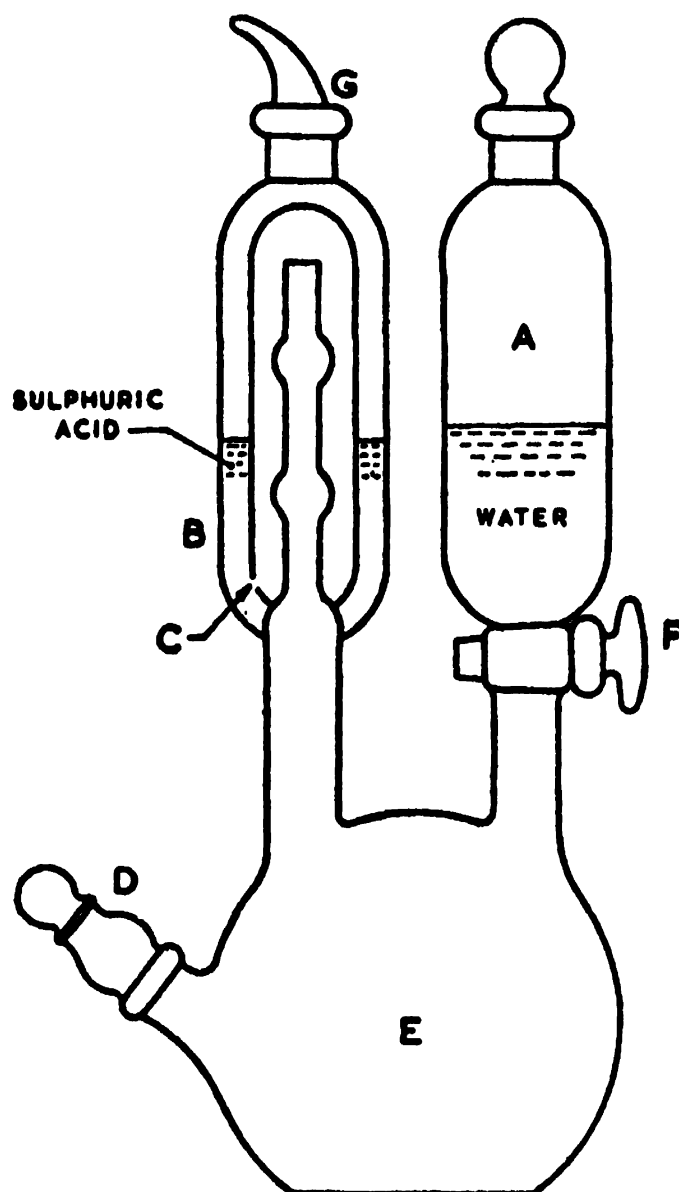


FIG. 1 SCHROEDTER'S ALKALIMETER

**A-1.4 Calculation****A-1.4.1 Available carbon dioxide,**

$$\text{percent by mass} = \frac{100 \times (M_2 - M_1)}{M_2 - M}$$

where

$M_2$  = mass of alkalimeter with sample, before decomposition;

$M_1$  = mass of alkalimeter with sample, after decomposition;  
and

$M$  = mass of alkalimeter before introducing the sample.

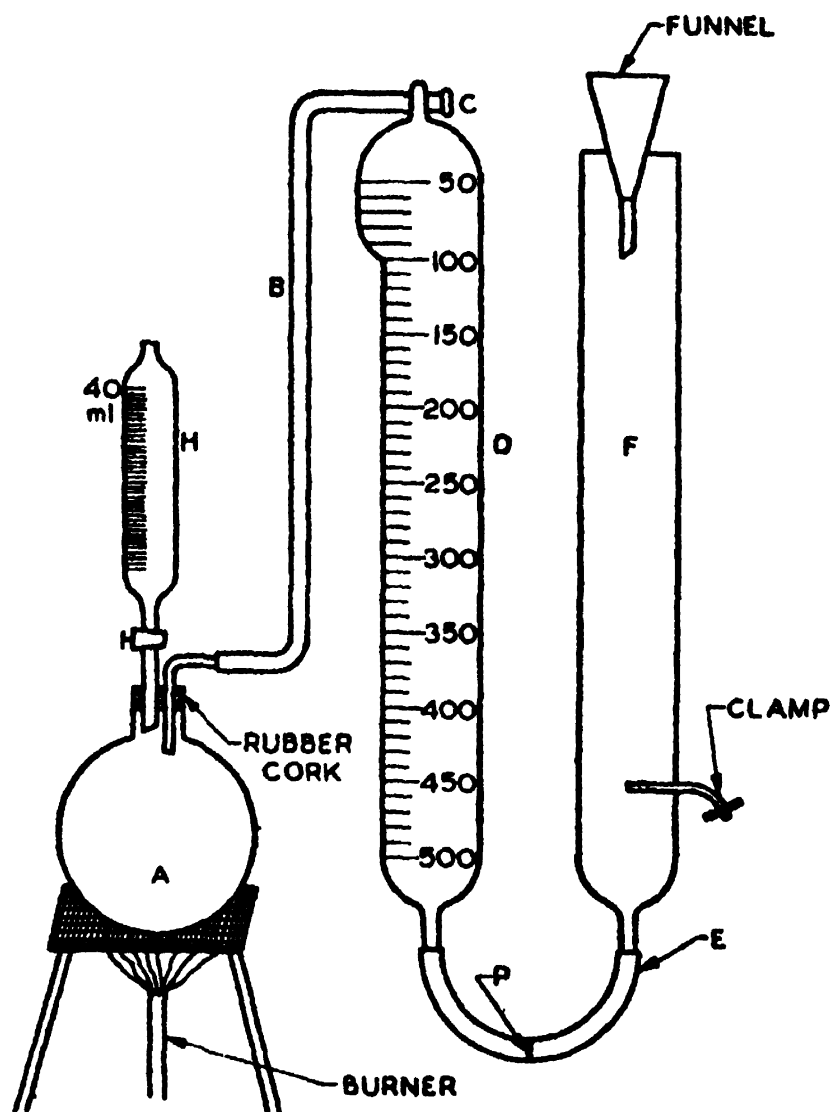


FIG. 2 GASOMETRIC ASSEMBLY

**A-2. METHOD II****A-2.1 Apparatus**

**A-2.1.1** A recommended apparatus of the gasometric assembly, as assembled, is shown in Fig. 2.

**A-2.1.1.1 Assembly** — The apparatus consists of a 250-ml, wide mouthed extraction flask *A* made of heat resistant glass, connected by a short bent glass tube to a rubber tube *B*. This is connected by a two-way stopcock *C* to a gas measuring tube *D* which is graduated in millilitres at 20°C with zero mark at the point just below the top and graduated up to 500-ml. Through the other hole is passed a 40-ml burette *H* graduated in ml at 25°C and numbered at 1-ml intervals. The gas measuring tube is connected to a levelling tube *F* through a rubber tube *E* having a pinchcock *P* to control the flow of solution.

## A-2.2 Reagent

**A-2.2.1 Displacement Solution** — Dissolve 100 g sodium chloride or sodium sulphate in 350-ml water. Add accurately 1 g sodium bicarbonate and 2 ml methyl orange (0.5 percent aqueous solution) and then enough sulphuric acid or hydrochloric acid to make just acidic (decidedly pink). Stir until all  $\text{CO}_2$  is removed. This solution is used in gas measuring tube and levelling bulb and seldom needs correction.

## A-2.3 Procedure

**A-2.3.1** Accurately weigh 2.5 g sample into flask *A*. Using the two-way stopcock *C*. Connect with both gas measuring tube *D* and levelling tube *F* to atmosphere and fill them with displacement solution up to the zero mark of tube *D*. Connect decomposition flask *A* with rubber tube *B* and turn stopcock so that the gas measuring tube is connected to decomposition flask and disconnected from atmosphere. Fill the burette *H* with distilled water up to the 40-ml mark. Let apparatus stand 1 to 2 minutes so that the temperature and pressure within the apparatus comes to room conditions. Open stopcock (or pinchcock) *P* and bring down the solution level in glass levelling tube *F* to reduce pressure within apparatus. Collect the displacement solution in a glass beaker and reserve for re-use later. Slowly add to decomposition flask, from burette *H*, 35 ml of distilled water. To allow uniform mixing of contents, rotate decomposition flask with swirling action and then put it on a wire gauze over a tripod stand and heat it to boiling with a Bunsen or Bursane burner. To prevent overflowing of displacement solution in levelling tube fill to a level lower than the overflow capacity. Occasionally rotate the decomposition flask to ensure uniform mixing of contents and complete evolution of  $\text{CO}_2$ . Then the mixture in decomposition flask foams up and the foam reaches the neck of the flask, stop heating and quickly immerse decomposition flask in cold tap water kept in a tray below. Also pour water over the decomposition flask while rotating it to bring the contents to the temperature of water in the tray. When this happens wait for further five minutes to secure equilibrium. Equalize pressure in measuring tube by pouring solution in levelling tube, using the pinchcock *P* if necessary and read the volume *V* in the measuring tube.

## A-2.4 Calculation

**A-2.4.1** Deduct from this volume *V*, the volume of distilled water added namely 35 ml to get the corrected volume of  $\text{CO}_2$  evolved after decomposition at atmospheric temperature and pressure.

From the following equation the volume of carbon dioxide at normal temperature and pressure is obtained:

$$V_2 = \frac{T_2}{P_2} \times \frac{P_1 V_1}{P_1 T_1}$$

where

$V_2$  = volume of  $\text{CO}_2$  calculated at normal temperature and pressure,

$T_2$  = normal temperature ( 273°K or 0°C ),

$P_2$  = normal pressure ( 760 mm ),

$P_1$  = corrected barometric pressure at temperature  $T_1$ ,

$V_1 = V - 35 \text{ ml}$  = corrected volume of  $\text{CO}_2$  evolved after decomposition, and

$T_1$  = observed temperature of displacement solution.

Now one gram mole ( 44 g ) of carbon dioxide, at NTP, will occupy 22 400 ml, that is, 22 400 ml of  $\text{CO}_2$  at NTP, weigh 44 g.

Therefore  $V_1$  ml  $\text{CO}_2$  at NTP will weigh:

$$\frac{V_1}{22\,400} \times \frac{44}{1}$$

Now  $\frac{V_1}{22\,400} \times \frac{44}{1}$  g of carbon dioxide are obtained from 2.5 g of baking powder.

Therefore available carbon dioxide percent

$$\begin{aligned} \text{by mass} &= \frac{100}{2.5} \times \frac{V_1}{22\,400} \times \frac{44}{1} \\ &= 40 \times \frac{V_1 \times 44}{22\,400} \end{aligned}$$

## APPENDIX B

( Clause 6.1 )

### SAMPLING OF BAKING POWDER

#### B-1. GENERAL REQUIREMENTS OF SAMPLING

**B-1.0** In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

**B-1.1** Samples shall be taken in a protected place not exposed to damp air, dust or soot.

**B-1.2** The sampling instrument shall be clean and dry when used.

**B-1.3** Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

**B-1.4** The samples shall be placed in clean, odourless and dry glass



containers. The sample containers shall be of such size that they are almost completely filled by the sample.

**B-1.5** Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

**B-1.6** Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

**B-1.7** Sampling shall be done by a person, agreed to between the purchaser and the vendor and in the presence of the purchaser ( or his representative ) and the vendor ( or his representative ).

## **B-2. SCALE OF SAMPLING**

**B-2.1** Lot — All the containers in a consignment belonging to the same batch or manufacture shall constitute a lot.

**B-2.1.1** Samples shall be tested from such lot for ascertaining conformity of the material to the requirements of the specification.

**B-2.2** The number of containers to be tested from a lot shall depend on the size of the lot and shall be in accordance with Table 2.

---

**TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING**

TOTAL NUMBER OF CONTAINERS IN THE LOT	NUMBER OF CONTAINERS TO BE SELECTED
$N$ (1)	$n$ (2)
Up to 50	3
51 to 100	4
101 to 300	5
301 to 500	6
501 and above	7

---

**B-2.3** The containers to be selected for sampling shall be chosen at random from the lot and, for this purpose, random number tables ( see IS : 4905-1968\* ) shall be used. In case such tables are not available, the following procedure may be adopted:

Starting from any container, count them as 1, 2, 3 .....,  $r$  and so on, in one order. Every  $r$ th container thus counted shall be chosen,  $r$  being the integral part of  $N/n$ , where  $N$  is the total number of containers in the lot and  $n$  the number of containers to be selected ( see Table 2 ).

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\*Methods for random sampling.

### **B-3. TEST SAMPLES AND REFEREE SAMPLES**

**B-3.1 Preparation of Individual Samples** — Empty out the contents of the container on a sheet of paper and mix thoroughly. Cone and quarter as often as necessary till about 75 g of the material is left. From this take about 15 g of the material and divide it into three equal parts. Each part so obtained shall constitute an individual sample representing the container and shall be transferred immediately with particulars given in B-1.5. The individual samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, the other for the vendor and the third for the referee.

**B-3.2 Preparation of a Composite Sample** — From the material from each selected container remaining after the individual sample has been taken, equal quantities of material shall be taken and mixed together so as to form a composite sample weighing not less than 160 g. This composite sample shall be divided into three equal parts and transferred to clean dry glass containers and labelled with the particulars given in B-1.5. One of these composite samples shall be marked for the purchaser, the other for the vendor and the third for the referee.

**B-3.3 Referee Samples** — Referee samples shall consist of a set of individual samples ( *see* B-3.1 ) and a composite sample ( *see* B-3.2 ) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the two.

### **B-4. NUMBER OF TESTS**

**B-4.1** Tests for requirements given in 3.1 and available carbon dioxide shall be conducted on each of the samples constituting a set of individual test samples ( *see* B-3.1 ).

**B-4.2** Tests for the remaining characteristics, namely, arsenic and lead, shall be conducted on the composite sample ( *see* B-3.2 ).

### **B-5. CRITERIA FOR CONFORMITY**

**B-5.1** The lot shall be considered satisfactory in respect of the requirements of B-4.1. if each individual sample satisfies all the requirements.

**B-5.2** The lot shall be considered satisfactory in respect of the requirements of B-4.2, if the test results on the composite sample satisfy the corresponding requirements.

**B-5.3** The lot shall be declared to be in conformity with all the requirements of this specification, if it has been found satisfactory in accordance with B-5.1 and B-5.2.

# BUREAU OF INDIAN STANDARDS

## Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 331 01 31

331 13 75

Telegrams : Manaksanstha

(Common to all Offices)

## Regional Offices :

	Telephone
Central : Manak Bhavan, 9, Bahadur Shah Zafar Marg, NEW DELHI 110002	{ 323 76 17 323 38 41
* Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054	37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 16 40
Southern : C.I.T. Campus, IV Cross Road, MADRAS 600113	235 23 16
† Western : Manakalaya, E9 MIDC, Marol. Andheri (East). BOMBAY 400093	832 92 96

## Branch Offices :

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48
‡ Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road. BANGALORE 560058	39 49 55
Gangotri Complex, 5th Floor, Bhadbhade Road, T.T. Nagar. BHOPAL 462003	55 40 21
Plot No. 21, Satyanagar, BHUBANESHWAR 751007	40 36 27
Kalai Kathir Building, 6/48-A Avanasi Road, COIMBATORE 641037	21 01 41
Plot No. 43, Sector 16A, Mathura Road, FARIDABAD 121001	8-28 88 01
Savitri Complex, 116 G. T. Road, GHAZIABAD 201001	8-71 19 96
63/5 Ward No. 29, R.G. Barua Road, 5th By-lane. GUWAHATI 781003	4 11 37
6-8-56C L. N. Gupta Marg. ( Nampally Station Road ) HYDERABAD 500001	20 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302006	52 13 74
117/418 B Sarvodaya Nagar, KANPUR 208005	21 68 76
Plot No. A-9, House No. 561/63, Sindhu Nagar, Kanpur Road. LUCKNOW 226005	5 55 07
Patliputra Industrial Estate, PATNA 800013	26 23 06
C/o Smt. Sunita Mirakher, 66 D/C Annexe, Gandhi Nagar, JAMMU (TAWI) 180004	—
T. C. No. 14/1421, University P. O., Palayam THIRUVANANTHAPURAM 695034	6 21 04
<b>Inspection Offices (With Sale Point) :</b>	
Pushpanjali, First Floor, 205-A West High Court Road. Shankar Nagar Square, NAGPUR 440010	62 61 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 36
*Sales Office Calcutta is at 5 Chowringhee Approach P. O. Princep Street, CALCUTTA	27 99 65
† Sales Office is at Novelty Chambers, Grant Road, BOMBAY	309 65 28
‡ Sales Office is at Unity Building, Narasimharaja Square BANGALORE	22 39 71